LIVE ACCESS SERVER:
A TOOL FOR WEB ACCESS TO *IN SITU* DATA COLLECTIONS, TOO

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ABSTRACT

The Live Access Server (LAS) has become a popular system with which to provide Web access to gridded data sets. With a simple web browser interface LAS users can i) specify the location, time and variable of interest , ii) request visualizations along principle axes and planes, and iii) download subsets in a choice of formats. With a few more mouse clicks they can "fuse" (compare by differencing or co-plotting) variables that may be defined on different coordinate grids, stored in unlike file formats, and located at distributed sites. (Other papers will discuss access to distributed data via the Distributed Ocean Data System (DODS) (Hankin., 2001)).

The style of access that LAS provides for gridded data is also applicable to large collections of in-situ measurements. Users of measured data often want to view a collection as a whole - a 4-dimensional region in which, although the variables are not gridded, they can be subsetted and visualized along lines and planes in much the same style as gridded data. A common example arises in collections of ocean profiles where the user may wish to visualize (say) a latitude-longitude plot of temperature at a fixed depth despite the non-uniformity of the data collection techniques.

Recent development work on LAS has focused on this approach to data management. In this presentation we will demonstrate LAS systems for in-situ collections and discuss the challenges of data fusion for mixed gridded and in-situ data sets. The authors believe that this style of access to in-situ collections will be instrumental in promoting greater use of in-situ measurements in model validation.

1. INTRODUCTION

Since 1994 the Live Access Server (LAS) has been providing visualization and subsetting of multi-dimensional scientific data for Web users (Hankin et. al., 1998). Chief among the initial design goals of LAS was to break through the data access barriers of file size, location, and format by providing three key areas of functionality: visualization, subsetting with reformatting.

More recent versions of LAS extended these initial goals to include access to distributed data sets (via DODS), data fusion (regridding and comparison), collaborative "sister server" networks (Sirott et. a., 2001) and much greater levels of configurability and scalability.

A major thrust in the current work on LAS is extending functionality to fully support in-situ data collections. This work involves modifications to all aspects of LAS: the user interface, the output products generation, the configurability framework, and the data fusion framework.

2. SUPPORT FOR *IN SITU* DATA IN LAS

Typically the strategies utilized in the management of *in situ* data collections are very different from those used for gridded data sets. The highly ordered and complete nature of gridded data sets makes them well suited to formats such as netCDF (Unidata, on-line) or HDF (NCSA on-line), whereas the character of *in situ* collections makes relational data bases better suited to the task

While data management strategies may differ greatly between gridded and *in situ* data sets, from the users' point of view the data access requirements are very similar. In both cases the user specifies a region of interest in space and time, a list of the variable(s) of interest, and constraints. In both cases the user will want the option to view graphical products or to download formatted files. In both cases the range of product that is meaningful depends upon the geometry of the request – for example LAS may offer line plots for time series, contour plots for vertical sections, and data files only for data volumes. In both cases the collection of meaningful constraints, which may be based on the values of other variables or typically metadata values for *in situ* data, is a function of the individual data set or variable(s)

LAS is a kind of "traffic cop". It is not a data management system. It receives requests in the form of XML packets transmitted via HTTP (the Web), decodes these requests in the memory of the server into meaningful "objects" – e.g. a request object might be "a contour plot of global SST for the month of Jan. 1996 from the COADS 1b data set" – and passes the request to a "back end" application (e.g. Ferret, GrADS, IDL,...) to produce the product. Thus the differences between gridded and *in situ* data from the LAS point of view are largely differences of configuration, not fundamental differences in the work being performed.

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3. **CONCLUSION**

The ability of LAS to handle in situ data sets has already been demonstrated in several LAS servers, for example the US JGOFS data server (US JGOFS, on-line). The effort to achieve full support for these data types is centering on a more sophisticated configurability framework and a more extensible user interface design that directly addresses the custom constraints (e.g. cruiseID) that may be appropriate to each data collection.

The redesign of LAS which is addressing in situ data requirements is also addressing a number of improvements to the user interface: the selection of data sets will be hierarchal and richer in metadata; the dependency on Java and JavaScript will be reduced, and hooks will be added to support transformations, filters and user-controlled gridding, and differencing between in situ data sets in future versions.

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3. **REFERENCES**

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